

ABSTRACT

The present invention provides a novel process of recovering unreacted ammonia from a reactor effluent. . This novel process includes at least the following steps: (1) quenching a reactor effluent containing ammonia with a first aqueous ammonium phosphate quench solution, wherein the pH of the solution is less than about 3.5, thereby absorbing ammonia to form a second aqueous ammonium phosphate solution richer in ammonium (NH_4^+) ions than the first solution but substantially free of dissolved CO_2 , (2) heating the second solution to an elevated temperature to reduce the amount of ammonium ions present to substantially the same level present in the first solution and thereby generate a vaporous stream containing ammonia, (3) recycling said vaporous stream containing ammonia to a reaction zone in a manner that minimizes the contamination of the reaction zone.